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### The relationship between insight and violence in psychosis

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# **The Relationship between Insight and Violence in Psychosis: A Systematic Literature Review**

## **Abstract**

Poor insight is a risk factor for violence within established risk-assessment tools, yet its relationship to violence in people experiencing psychosis is unclear. To clarify this issue, we sought to systematically review studies investigating the relationship between poor insight and violence in psychosis. A systematic search of studies published between 1980 and 2019 was carried out using Pubmed, Embase, Medline, PsychInfo and CINAHL databases. From combined search results of 5701 articles, 18 observational studies met the inclusion criteria and were selected for full-text review and quality grading. 8 demonstrated a positive relationship between poor insight and violence whilst 10 failed to find this relationship. Significant methodological limitations were found across studies. Those measuring the clinical insight dimension specifically and reliably were most able to demonstrate a positive relationship between poor insight and violence. Choice of measurement tool and co-variables such as psychopathy were found to influence this relationship. We therefore found partial evidence in support of a relationship between poor insight and violence in psychosis. In order to gain enhanced understanding of this relationship, better quality research accounting for relevant co-variables and using appropriate measurement tools which target the ‘clinical’ insight dimension is required.

**Keywords:** Psychosis, Insight, Violence, Schizophrenia, Aggression

## Introduction

Psychosis is a broad term used to describe abnormalities in thinking, perception, emotions, language, sense of self and behaviour. The Diagnostic Statistical Manual 5 (American Psychiatric Association (APA), 2013) continues to classify experience of psychosis within diagnostic categories. Yet, encouragingly and in line with growing research (Brandon et al., 2009), the DSM-V chapter ‘Schizophrenia Spectrum and Other Psychotic Disorders’ begins to position psychosis on a continuum. It gives less prominence to schizophrenia per se, with enhanced focus on the five domains associated with experience of psychosis: hallucinations, delusions, disorganised thought, abnormal motor behaviour and negative symptoms (Heckers et al., 2013).

Experience of psychosis is associated with negative outcomes such as: poor physical health (Moreno et al., 2013); early mortality (Fazel, Wolf, Palm & Lichtenstein, 2014), and in a minority of individuals, violence (O’Shea, Picchioni, Mason, Sugarman & Dickens, 2014). Due in particular to the latter, persons with psychosis often experience stigma and inequalities. Improved understanding of the relationship between psychosis and violence may support the reduction of stigma, yet research has produced contrasting findings. For example, the MacArthur violence study (Monahan et al., 2001) followed up N=1136 patients discharged from psychiatric hospitals for a year, finding schizophrenia to be associated with lower violence rates than personality disorders, depression and bi-polar-affective disorder. Additionally, they found no significant relationship between a diagnosis of schizophrenia and violent behaviour. Studies focussing only on diagnosis however, may fail to measure variables present ‘within’ psychosis. We respectfully suggest that it may be advantageous instead, to

study dynamic and clinical variables relevant to psychosis in relation to violence, as opposed to diagnosis led research.

Insight into mental health difficulties is a clinical variable (Dam, 2006) which may provide clarity on why a minority of individuals with psychosis behave violently, whilst the majority do not. Encompassed and assessed within gold standard risk assessment tools such as the Historical Clinical Risk Management version 3 (HCR-20v3; Douglas, Hart, Webster & Belfrage, 2013), poor insight is positioned as predictive of violence. To date however, no systematic review or meta-analysis has clarified the true extent of this relationship.

In psychological literature and practice, insight is often understood as a clinical concept. Amador and David (1998) defined 'clinical insight' as an individual's awareness and understanding of their mental health difficulties. However, insight is unlikely to be a unitary concept (Amador et al., 1993), with Capdevielle et al. (2013) finding a number of dimensions to contribute towards its disposition. Cognitive insight (Beck, Baruch, Balter & Steer, 2004) has been proposed as a further dimension. It refers to the ability to recognise mistakes in ones thinking and to consider alternative explanations for the same. Considering both clinical and cognitive insight dimensions, an individual may hold a reasonable level of clinical insight e.g. by being aware that they are experiencing psychosis, yet have poor cognitive insight e.g. if they are unable to consider alternative perspectives for their beliefs. This example highlights the complex multi-dimensional nature of insight and alludes to the difficulties in its assessment.

Although not associated exclusively with psychosis, poor insight is a core feature of psychotic experience. Poor insight in psychosis is associated with adverse outcomes including medication non-adherence (Higashi et al., 2013) and violence and aggression (Ekinici & Ekinici, 2013),

making reliable assessment all the more essential. Arguably however, due to its multidimensionality, assessment tools are often limited in their attempts to measure insight (McCormack, Tierney, Brennan, Lawlor & Clarke, 2013). As such, the literature is dominated by studies which select one measurement scale and apply it to the whole concept, often without defining the insight domain they aim to measure (e.g. Slijepcevic et al., 2014). Additionally, different insight dimensions appear to be associated with different variables. For example, poor clinical insight has consistently been associated with medication non-adherence (Day et al., 2005; Jonsdottir et al., 2013), whilst evidence is lacking with regards to the relationship between cognitive insight and adherence. Misleading findings could be produced should researchers select measurement scales which do not correspond with intended insight dimensions. These conceptual and methodological difficulties highlight how insight continues to be an elusive feature of psychosis, not yet fully understood.

The propensity for a minority of individuals with psychosis to behave violently is a debated and sensitive issue. A meta-analysis by Fazel, Gulati, Linsell, Geddes & Grann (2009) found experience of schizophrenia and other psychoses to be associated with an elevated risk of violence. Although much of the excess risk associated with violence in these studies was mediated by substance abuse, risk of homicide was increased in individuals with psychosis both with and without substance abuse compared to general population controls. Swanson et al. (2006) more closely investigated the clinical variables inherent within psychosis, as opposed to diagnosis only, in N=1410 community patients. A significant relationship between psychosis and violence was identified. Positive symptoms were associated with an increase in both minor and serious violence, whilst negative symptoms were associated with reduced rates of serious violence. Witt, Van Dorn & Fazel's (2013) meta-regression of 110 studies supported Swanson et al.'s. (2006) findings. They found greater positive symptoms to be associated with violence

in psychosis whilst violence was not associated with negative symptomatology. Thus, it is unlikely to be psychosis in its entirety which is related to violence. Rather, it may be specific clinical variables such as positive symptoms and poor insight which hold greater relevance to our understanding of violence in psychosis.

In a sample of outpatients with psychosis without co-morbid substance abuse, Ekinici and Ekinici (2013) compared patients with a history of violence to a non-violent control group. The non-violent group were found to have significantly higher clinical insight than the violent group, with lower clinical insight predictive of violence. Although this relationship is also demonstrated within other studies (e.g. Arango, Calcedo-Barba, González-Salvador & Calcedo-Ordóñez, 1999; Goodman, Knoll, Isakov, & Silver, 2005) methodological quality varies greatly. For example, although Lincoln and Hodgins (2008) found poor insight to be associated with violence in uni-variate analysis, when positive symptoms and psychopathy were controlled for, insight did not contribute to the prediction of violent behaviour in persons with psychosis. Failure to control for key variables may then create differing results between studies. Other methodological limitations such as small sample sizes (e.g. Carroll Pantelis & Harvey 2004), retrospective designs (e.g. Soyka, Graz, Bottlender, Dirschedl & Schoech, 2007) and the use of inappropriate measurement tools (e.g. Slijepcevic et al., 2014) limit our ability to understand the relevance of poor insight to violence in psychosis. Moreover, no amalgamation of existing research has been produced so far, rendering the relationship vague. Considering the lack of consensus in the relationship between insight and violence in psychosis, yet the use of poor insight as a violence risk factor in tools such as the HCR-20v3, it now seems essential to undertake a systematic literature review to clarify the extent to which a positive relationship between poor insight and violence in psychosis exists.

## **Methods**

### ***Inclusion Criteria***

All observational studies published between 1980 and 21<sup>st</sup> of March 2019, which investigated the relationship between insight and violence in individuals with psychosis were included. The review sampled participants over the age of 16 who experienced psychosis within recognised schizophrenia spectrum and other psychotic disorders according to DSM-5 criteria (APA; 2013). Patients with bi-polar disorder were included only when they were present within mixed samples and only when the study clarified that they experienced psychosis. A broad range of patient samples were included, from community civil-psychiatric patients to patients within forensic mental health hospitals.

### ***Exclusion Criteria***

Non-English language, intervention, single case and qualitative studies were excluded. Studies which considered violence only in the form of self-harm/suicide were excluded as were studies which included patients under the age of 16 and those sampling patients with intellectual disabilities. Studies which sampled patients with a diagnosis of bi-polar-affective disorder only were excluded as were studies which did not clarify psychotic experience of participants with bi-polar disorder when they were included within mixed diagnostic samples. Studies which measured insight via only clinician/researcher opinion and without the use of a validated insight measurement tool were also excluded. This included studies which may have used the HCR-20 item 'C1' 'lack of insight' as their only insight measurement, as reliability/validity of this single item has not been demonstrated.

### ***Literature Search Strategy***



Literature searches were carried out on the following electronic databases, producing articles published within stated date ranges: PubMed (1980-21<sup>st</sup> March 2019), Embase (1980- 21<sup>st</sup> March 2019), MedLine (1980-21<sup>st</sup> March 2019), PsychInfo (1987- 21<sup>st</sup> March 2019) and CINAHL (1980- 21<sup>st</sup> March 2019). A preliminary search of these databases was carried out to ensure there were no existing systematic reviews on the current topic, Cochrane and Prospero databases were also searched for this purpose. The following search terms were then entered into each database; (INSIGHT) OR (AWARENESS) OR (UNDERSTANDING) OR (COMPREHENSION) AND (PSYCHOSIS) OR (PSYCHOTIC) OR (SCHIZOPHRENIA) OR (SCHIZO-AFFECTIVE) OR (MENTAL ILLNESS) AND (VIOLENCE) OR (AGGRESSION) OR (CHALLENGING BEHAVIOUR) OR (HOSTILITY).

Grey literature was searched via reference lists of studies which met the inclusion criteria and by retrieving studies which cited included articles. Citation searches were carried out using Scopus. The review was then registered on the University of York's database for systematic reviews and meta-analyses.

### ***Search and Selection Strategy***

As per Figure 1. all articles produced by searches were screened for removal of duplicates. Titles and abstracts of remaining articles were then screened for relevance to the review question and those deemed not relevant were excluded. Remaining articles and those acquired from grey literature were then retrieved in full-text. Each article was read in full and subjected to inclusion/exclusion criteria by a single reviewer. Studies which fulfilled the inclusion criteria were selected for full review and those which did not fulfil inclusion criteria were excluded.

### ***Risk of Bias and Methodological Quality Assessment***

The risk of bias and methodological quality of studies was assessed using the ‘Quality Appraisal Checklist for Quantitative Studies Reporting Correlations and Associations’ (National Institute of Clinical Effectiveness (NICE), 2012). This tool facilitates appraisal of the internal and external validity of studies which report on correlation analyses. The tool was adapted slightly for use in this review to better reflect the properties of included studies. For example, all studies were observational in nature and therefore items relating to intervention studies were omitted. To promote clarity and consistency of ratings, all items were also fully operationalised, thereby expanding upon the original descriptions of items provided by NICE<sup>1</sup>. There is evidence that comparison of studies by a total numerical score lacks objectivity due to unequal item weightings (Whiting, Harbord & Kleijnen, 2005). The NICE checklist scoring system therefore provides grading in symbol terms. For a general overview of study quality, each study is also awarded quality grading for internal and external validity.

All studies were subject to quality assessment by the researcher. To reduce the potential bias that may exist within this process, a suitably qualified 2<sup>nd</sup> independent reviewer graded 6 of the 18 studies. Agreement between reviewers on methodological quality was found to be excellent with an intra-class coefficient (ICC) of .877 (Cicchetti, 1984). Minor disagreements on grading were resolved through discussion between reviewers and any changes made were applied consistently across studies.

### ***Data Extraction***

A data extraction table<sup>2</sup> was created to summarise all studies included in the review. This incorporated various components of the ‘Quality Appraisal Checklist...’ (NICE, 2012) and also more specific study information.

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<sup>1</sup> For comparison of the NICE quality appraisal tool and this study’s fully operationalised version please see appendices 3 & 4

<sup>2</sup> See Table 1

**Figure 1. Study Selection Flow Chart (Insert Here)**

## **Results**

### ***Participants***

6231 patients were included in this review across 18 studies. Studies were carried out in various countries with 3 conducted in the USA; 3 in Turkey; 2 multi-site across the USA and several

European countries; 2 in Ireland, 2 in Spain and 1 in Mexico, China, Croatia, Australia, Israel and Germany respectively. All patients experienced psychosis within various diagnoses, the most common being schizophrenia. Diagnostic samples showed good variation including first episode psychosis and mixed schizophrenia spectrum disorder samples. The mean age of patients was 36.12 and the majority of patients were male.

All studies used opportunity sampling, with five sampling consecutively admitted patients to a service. Calatayud et al. (2012) did not provide any information on sampling strategy whilst only Carroll et al. (2004) commented on how many patients were invited to participate in their study in comparison to how many actually did. Patient samples included forensic inpatients (Alia-Klein, O'Rourke, Goldstein & Malaspina, 2007; Goodman et al., 2005; Carroll et al., 2006; Slijepcevic et al., 2014), forensic outpatients (Lincoln & Hodgins, 2008), outpatients attending community mental health centres (Swanson et al., 2006; Foley et al., 2005), outpatients attending hospital services (Fresan et al., 2005; Ekinci & Ekinci, 2013; Yen, Yeh, Chen & Chung, 2002; Volavka et al., 2016), discharges from a university psychiatry service (Soyka et al., 2007), county jail and court psychiatric clinic attendees (Buckley et al., 2004) and civil psychiatric inpatients (Arango et al., 1999; Foley et al., 2007; Kosger et al., 2015; Umut, Danismant, Kucukparlak & Karamustafalioglu, 2018), creating good generalizability for this review.

**Table 1. Characteristics of Included Studies (Insert here)**

### *Study Designs*

All studies were observational in nature. The majority employed retrospective cohort or cross-sectional designs. This meant that insight and violence were measured in the past with their data subsequently collected for the purposes of research. Despite their ample use, these designs are liable to a high level of bias. Whilst Goodman et al. (2004) did well to minimise this bias by using an independent rater blind to study objectives and Foley et al. (2005) minimised bias by making use of multiple information sources for violence data collection, other studies were essentially flawed in their research design. In particular, Carroll et al. (2006) measured insight at time of study yet collected violent convictions from several years earlier. It is very likely that insight levels would have changed during the intervening period, particularly as patients began to receive treatment, highlighting the unreliable nature of this research design relative to the aims of the study.

Two studies used retrospective case-control designs, comparing insight in violent individuals to insight in non-violent individuals. Only four studies were designed prospectively. Prospective designs measure insight at baseline with patients then followed up for a period of time during which violence may or may not occur. The limited use of prospective designs in this area is unfortunate as these offer fewer potential sources of bias than retrospective and cross-sectional designs and are an adequate fit for observational research (Mann, 2003).

In some studies (e.g. Swanson et al., 2006; Goodman et al., 2005) the main focus was not insight and violence, with insight measured only as one of multiple variables. This meant that less detail

was provided on the measurement and collection of insight and violence data and that research designs were not necessarily tailored to a rigorous exploration of these variables' relationship.

### ***Insight Conceptualisation and Insight Measurement Tool***

There was wide variation in efforts to define insight and it was rarely clarified which insight dimension studies aimed to measure. Many studies did not provide any insight definition (Swanson et al., 2006; Slijepcevic et al., 2014; Volavka et al., 2016; Lincoln & Hodgins, 2008; Fresan et al., 2005; Soyka et al., 2007; Alia-Klein et al., 2008). Whilst the definition of insight assumed by studies could in some cases be derived by considering the insight assessment used, without a clear theoretical basis, insight measurement could be misguided. For example, Slijepcevic et al. (2014) did not define the insight dimension they intended to measure and without providing a rationale, used the BCIS, a cognitive insight measure, despite all other measured variables in their study being clinical in nature. Choosing a measure of clinical insight may have been more in line with study objectives and may have derived alternate findings. Without a clear theoretical rationale for the insight dimension they intended to measure however, their investigation was limited.

Ekinci and Ekinci (2013) did provide a clear definition of insight in terms of both clinical and cognitive dimensions. They subsequently applied the SUMD, a clinical insight measure, and the BCIS. This provided clarity on both study objectives and results, enhancing reliability and generalizability. Notably, providing an insight definition and using measures in line with definitions was more common in studies which found a positive relationship between poor insight and violence than in those which did not.



### *The Use of Valid Measurement Tools for Insight and Violence*

Beyond issues relating to insight dimensions and corresponding measurement scales, there was variability in choice of insight measurement more generally. Only 11 studies used an insight measurement which was validated and reliable for use with individuals with psychosis. The majority of these; the SUMD (Amador et al., 1993), the SUMD-R (Amador, Amodt, Marcinko, Seckinger & Yale, 1999) the SAI (David, 1990) and the ITAQ (McEvoy et al., 1981) measured clinical insight. The BCIS was applied to measure cognitive insight by Ekinici and Ekinici (2013) and Slijepcevic et al. (2014). Buckley et al. (2004) also measured forensic insight by use of the Eisner Scale (Eisner, 1989).

The use of the PANSS (Kay, Fiszbein & Opfer, 1987) G12 insight item ‘impaired judgement and insight’ was also common, with six studies using this alone as an insight measurement. G12 is a single item intended to assess patients’ understanding of their mental state via a trained rater’s clinical judgement. Although acceptable inter-rater agreement has been found for G12, albeit within a small sample (Bell, Milstein, Beam-Goulet, Lysaker & Cicchetti, 1992), the item was not designed to offer a comprehensive measurement of insight per se, rather a contribution of the concept to the wider spectrum of psychotic symptoms measured by the PANSS. It is therefore unlikely to be capable of reliably measuring the complexity of insight. Interestingly G12 was used in four studies which did not find a relationship between poor insight and violence compared to in only two studies which demonstrated this relationship.

In terms of violence measurement, the OAS (Yudofsky, Silver, Jackson, Endicott & Williams, 1986) is a widely used and well validated measure of violence carried out by individuals with

psychosis (O'Shea et al., 2014) yet only 8 studies applied the OAS or its modified version (MOAS). Swanson et al., (2006) and Lincoln and Hodgins (2008) used the McArthur Violence Instrument (Steadman et al., 1998) which although not validated specifically in individuals with psychosis, showed good reliability in a wider group of patients with mental health problems (Steadman et al., 1998). Similarly, Alia-Klein et al. (2000), Kosger et al. (2015) and Yen et al. (2002) used more general yet sufficiently reliable violence measurement tools. Of the remaining studies, Volavka et al. (2016) measured violence only through the PANSS (P7) hostility rating whilst Calatyud et al. (2012) measured violence via PANSS (P7) hostility and PANSS (G14) poor impulse control ratings. These appear to be limited violence measurements, especially as within both studies, ratings were made by the research teams who do not appear to have been blind to insight ratings, as these were also measured by the PANSS.

Carroll et al. (2004) and Soyka et al. (2007) failed to use any specific violence measurement tool, measuring violence only in terms of whether a patient had a violent conviction or not. This simplified measurement method may increase risk of bias as it excludes violence which may have occurred out-with convictions. Results of these studies are then unlikely to be reliable as there may have been violent outcomes not captured due to the applied measurement method.

### ***Reliable Collection of Violence Data***

Violence data was collected in a number of ways and as previously discussed, was often influenced by study design. Studies using prospective designs (Arrango et al., 1999; Foley et al., 2005; Lincoln & Hodgins, 2008; Yen et al., 2002) appeared to implement the most reliable violence data collection methods. Arrango et al. (1999) ensured nursing staff blind to study objectives, used the

OAS to score violent incidents at the end of every shift during the follow-up period. Researchers then collated these ratings, minimising the chance of researcher bias. Some studies which did not utilise independent raters such as Yen et al., (2002), reduced the risk of bias by using a single researcher blind to other study assessments to collate violence data and by accessing multiple data sources.

Violence data collection methods were less reliable in studies conducted with community samples, likely due to the additional complexities encountered when conducting research of this nature, out-with controlled inpatient environments. For example, Swanson et al. (2006) based their violence data collection on self-report interviews with patients. Although they endeavoured to reduce risk of bias by gaining a collateral report for each patient, these were available for less than half of the sample. This forced the study to be heavily reliant on self-report alone which is liable to under-reporting of violence.

Slijepcevic et al. (2014) and Fresan et al. (2005) did not outline their violence data collection method, whilst others were brief in their descriptions. Lincoln and Hodgins (2008) and Umut et al. (2018) carried out violence data collection via participant and collateral interviews yet did not clarify who conducted these interviews. Less experienced researchers or researchers un-blind to other study assessments may gain different findings than experienced independent researchers when conducting interviews which may have influenced results.

### ***Methodological Quality of Studies***

Quality grading for all studies are displayed in Table 2. It should be noted that quality rating is not an exact science. For example, a criterion could be deemed not applicable to a study whilst not reducing that study's overall quality. Subsequently, this review has not provided individual studies with a 'total' quality score. Taking this caveat into account, quality grading indicate that Arrango et al. (1999) carried out the strongest study methodically, with Calatayud et al. (2012) being of poorest overall quality.

**Table 2. Study Quality Ratings (Insert Here)**

### ***The Case for a Relationship between Insight and Violence in Psychosis***

Overall, 8 of the 18 studies demonstrated a positive relationship between poor insight and violence in psychosis with the majority of effect sizes ranging between small and medium, however large effects were also found. Ten studies did not find a relationship, highlighting a lack of clarity in the literature. The group which found significant positive relationships had a greater variety of study designs and implemented more valid violence data collection methods. The two groups were equal in terms of their diagnostic sample diversity. Power was reported by only one study in this review, and adequate power appeared to be achieved by 4 studies which found a positive relationship and by 5 studies which did not find this relationship.

### ***Positive Associations between Insight and Violence in Psychosis***

Three studies which demonstrated a positive relationship between insight and violence did so by means of correlation analysis. Buckley et al's (2004) study compared a group in custody for violent offences to a non-violent control group, finding violence to be significantly associated with poorer insight. However, confounding variables, primarily psychopathy and substance misuse, which may contribute to the insight – violence relationship, were not measured or controlled for. Indeed, across all reviewed studies, only Lincoln and Hodgins (2008) and Slipjecevic et al. (2014) controlled for psychopathy. Similarly, Catalayud et al. (2012) found a positive correlation between poor insight and hostility. However, both of these variables were measured only via their respective PANSS items, with few confounding variables included in analysis and within an overall poor quality study. In Goodman et al's. (2005) study, understanding the insight and violence relationship was a secondary focus, thus little detail was provided on the same. They used a very small (N=35) and specific sample of forensic inpatients. Although this sample restricted

generalizability, it allowed for a rigorous approach to violence data collection, albeit limited by failure to use a standardised violence measurement tool.

### ***Insight as a Predictor of Violence in Psychosis***

The remaining studies which supported a positive relationship between poor insight and violence demonstrated this by use of regression models. Ekinici and Ekinici (2013) found poor clinical and cognitive insight to predict violence in patients with schizophrenia. Although their sample (N=133) was small for regression, the study was strengthened by reliable insight and violence measurement and their data collection methods. Furthermore, although violence data was gathered retrospectively to insight measurement, only violent incidents occurring one week prior to insight measurement were collected, reducing the chance of clinically significant change in insight over this time. Arrango et al's. (1999) study was of similar high quality, strengthened more so by a prospective design and once again reliable data collection and measurement methods. They found poor clinical insight to significantly contribute to a model which correctly classified 84.3% of participants as violent or non-violent. A small sample size (N=63) limited the study although the patient sample was generalizable with mixed schizophrenia/schizoaffective disorder diagnoses. A number of confounding variables were also controlled for yet medication compliance, substance misuse and psychopathy were not included.

Soyka et al. (2008) benefitted from a large sample size and robust power for the use of logistic regression. However, they measured insight at hospital discharge only and collected violent conviction data up to 12 years afterwards. As insight is a dynamic concept, level of insight at time of violence conviction cannot be assumed to be of the same level as it was several years earlier.

Additionally, measuring violence in terms of convictions only, may have underestimated true violence rates. Both of these issues cast significant doubt over Soyka et al's. (2008) findings. Similar issues were apparent within Alia-Klein et al's. (2008) findings in their use of a 'lifetime assessment of insight' as oppose to insight assessment before or at the time of violent incidents.

### ***No Case for a Relationship between Poor Insight and Violence in Psychosis***

Ten studies found no relationship between poor insight and violence in psychosis. Lincoln and Hodgins (2008) is a pivotal study to consider within this argument as theirs was one of only two in this review which measured and controlled for psychopathy. Their analysis showed that although poor insight was associated with aggression uni-variately, when positive symptoms and psychopathy, as measured by the PCL-R (Hare, 1991) were entered into the model, insight no longer contributed to the prediction of aggression. This is an important finding as it suggests that insight may not contribute additional variance when psychopathy and positive symptoms are present in psychosis. It also opens up the possibility that had these variables been controlled for in other studies, positive relationships between poor insight and violence may not have been found. Although of good overall quality, Lincoln and Hodgins (2008) used only PANSS G12 and HCR20v2 C1 (insight) items for insight assessment. They also had a poor retention rate with only 86 of 216 participants followed up until 2 years post discharge. Reasons for drop-out were cited as refused, too ill or admitted to hospital, suggesting it was the 'most well' patients who were fully followed up and thus those with potentially higher levels of insight.

Swanson et al. (2006) retrospectively assessed violence in the six months prior to assessment of insight in outpatients experiencing schizophrenia. They did not find level of clinical insight to be

related to either minor or serious violence. However, their violence data collection method was limited by self-report, with collateral reports available for less than half of the sample. First episode psychosis and treatment resistant patients were also excluded which may have altered violence rates and increased insight levels. On the contrary, Foley et al's. (2007) study was carried out with first episode psychosis patients specifically and also failed to find a relationship between insight and violence. Their insight measurement was however limited to PANSS G12. Umut et al's. (2018) cross-sectional study also failed to find a relationship between poor insight and violence. Although they used valid insight and violence measurement tools, their violence data collection method was limited to patient and relative self-reporting which may have under-estimated violence rates.

Kosger et al. (2005) compared a group of patients with a history of violence to a non-violent group. They found no difference in level of insight between groups and no relationship between poor insight and violence. However, only historical violence was measured, whilst insight was measured at the time of study. Slijepcevic et al. (2014) carried out a similar study to Kosger et al. (2005) methodologically, comparing a violent and non-violent group in terms of violent history only. The same difficulties with this approach were subsequently evident. Yet this study included a wide range of confounding variables including positive symptoms, alcohol use and psychopathy, which strengthen its findings. Yen et al's. (2002) study also failed to find a relationship between poor insight and violence. Although the sample size (N=74) was small, a prospective design and various information sources for collection of violence data, accessed by a blind researcher, increased reliability of findings.



In Foley et al.'s. (2005) study, poor clinical insight was found to predict physical violence post-contact with a first episode psychosis service. This relationship was not found pre-contact with the service. This suggests that the retrospective data collection method employed was potentially unreliable or that inpatient environments may confound this relationship. Similarly, Volavka et al. (2016) found a uni-variate relationship between insight and hostility that failed to retain significance after correction for multiple comparisons. Insight and violence were however only measured by use of respective PANSS items.

Fresan et al. (2005) and Carroll et al. (2004) also failed to find a relationship, albeit both studies were of low quality and therefore less reliable in their findings. In particular, Carroll et al. (2004) assessed insight at time of study yet collected violent incidents from several years earlier. If insight was measured closer to the time of violent incidents occurring, the two variables may have correlated more closely. The study's sample of only 28 forensic patients with schizophrenia renders it not only low on internal reliability but also on generalizability.

## **Discussion**

Violent behaviour by a minority of individuals who experience psychosis is a poorly understood and much debated phenomenon which can contribute to the stigma experienced by this patient group (González-Torres, Ora, Arístegui, Fernández-Rivas, & Guimon., 2007). A number of variables appear to be associated with the perpetration of violence by individuals with psychosis (Witt et al., 2013) and one variable widely believed to do so, was poor insight. As such, insight is included as a risk factor for violence within tools such as the HCR-20v3. To date however, there

existed no systematic review evidencing a relationship between poor insight and violence in people experiencing psychosis.

Only 18 studies exploring this relationship were identified as suitable for systematic review, highlighting a low level of research in the area. Eight studies provided an argument for a positive relationship between poor insight and violence whilst ten were unable to demonstrate this relationship. These findings continue to make clarification of this issue challenging, particularly as studies on both sides of the argument suffered from significant methodological limitations. The most common limitations were; poorly designed studies, small and un-generalisable samples and biased data collection methods, all of which reduce the reliability of findings.

The issue relating to the importance of clear insight definition and choice of corresponding measurement tool is of relevance to this review's findings. It is notable that all studies which measured clinical insight by use of the SUMD, found a positive relationship between poor insight and violence. In some studies (e.g. Arrango et al., 1999; Buckley et al., 2004; Goodman et al., 2005) effect sizes were large. In particular, the SUMD item 'awareness of mental disorder' was measured by all studies which applied the tool and was consistently associated with violence across these studies. Indeed, 'awareness of mental disorder' is the essence of clinical insight (Amador et al., 1999) and thus reinforces the relationship between clinical insight and violence, as oppose to alternative insight dimensions. In contrast, cognitive insight as measured by the BCIS (Beck, Baruch, Balter & Steer, 2004) does not appear to be a reliable predictor of violence. Slipejevic et al. (2016) found no relationship and Ekinici and Ekinici (2013) found only a small effect when using the BCIS. These findings reinforce the argument that should insight dimensions fail to be clearly

defined and without appropriate assessment tools being selected on the basis of these definitions, insight measurement can be misguided and unreliable.

A further issue which should be taken into account when interpreting current findings is medication adherence. Poor clinical insight has been found to be associated with lower medication adherence (Jonsdottir et al., 2013) which could potentially mediate the relationship between insight and violence. Yet, only 3 studies included adherence in their analyses and these produced differing findings. Whilst Volavka et al. (2016) found a significant relationship between poor insight and violence to be lost after correcting for multiple comparisons, a significant positive relationship between poor medication adherence and violence remained. Insight was however only measured via PANSS G12 which may not have accurately measured clinical insight. Umut et al. (2018) also found 'treatment' adherence to be significantly correlated with higher insight and also found the mean OAS scores of "non-adherent" patients to be significantly higher than patients with 'treatment' adherence. Crucially, Umut et al. (2018) do not define 'treatment adherence' thus the aspects of treatment they refer to cannot be determined, rendering their contribution to this argument limited. Alternatively, although Alia-Klein et al. (2007) also found poor medication adherence to be associated with violence, a strong positive relationship between poor insight and violence continued to exist. Additionally, no relationship was found between poor insight and medication adherence when clinical insight was measured with the SUMD-R. These findings contribute to the consensus developed by this systematic review that inadequate measurement of clinical insight such as through PANSS G12, may render the concept less robust in analysis, allowing alternative variables to account for its variance. In contrast, when insight is measured

accurately with reliable measurement tools, it appears to be able to contribute its own variance to violence despite the presence of other important variables, such as medication adherence.

A compelling argument against a positive relationship between poor insight and violence comes from reviewed studies which controlled for psychopathy. Lincoln & Hodgins (2008) used a mixed forensic/civil psychiatric outpatient sample whilst Slipejevic et al's. (2014) sample was mixed forensic/civil psychiatric inpatients. Both measured and included psychopathy in their analysis, failing to find relationships between poor insight and violence. Psychopathy rates were however likely to have been higher within these studies due to the inclusion of forensic patients, where the construct is relatively more common (Hare, 2003). Furthermore, it should be noted that Slipejevic et al. (2014) measured cognitive insight as oppose to clinical insight, which may also have led to a non-significant relationship. It is a limitation of both studies that sub-group analysis was not carried out as it would have been useful to understand if poor insight remained non-significant when psychopathy was included within civil-psychiatric samples only, where psychopathy rates are likely to have been lower (Skeem & Mulvey, 2001). As psychopathy is a strong predictor of violence in individuals experiencing psychosis (van Dongen, Buck & van Marle, 2016) and indeed in persons without psychosis (Hart, 1998), it may be that within forensic populations where psychopathy is more prevalent, that psychopathy as a robust concept, reduces the variance insight may provide.

In contrast, only a very small minority of patients with schizophrenia, particularly in civil-psychiatric samples present with psychopathy (Nolan, Volavka, Mohr & Czobor, 1999). Relatedly, four of the studies that demonstrated a positive relationship between poor insight and violence

used civil-psychiatric samples, highlighting the apparent usefulness of poor insight as a predictor of violence within this population. Had psychopathy been measured and included in analysis within these studies, it may have been less significantly associated with insight. Poor insight then does appear to be less important in the prediction of violence in patients who experience higher levels of psychopathy, such as those within the forensic mental health system. In samples where psychopathy is not as prevalent, such as in civil-psychiatric patients, poor insight would appear to be a more robust predictor of violence. Future research is however required to further understand the complex interactions between poor insight, psychopathy and violence in psychosis.

### ***Future Research***

Additional good quality research is required to provide a fuller understanding of the reviewed issue. Research in this area may however continue to be limited by the complexities that occur when attempting to recruit individuals experiencing psychosis. Many individuals with psychosis are inpatients engaged in rigorous care and treatment programmes which health care professionals may be averse to disturbing with research (Hickson, 2013). Yet, there are manageable ways around this issue, such as by making use of routinely collected data. It is recognised that conducting research with civil-psychiatric outpatients remains a challenge, particularly in terms of violence data collection. However, use of multiple violence data sources and collateral informants can contribute towards good quality research with this population.

Future research should take account of methodological weaknesses existing within studies outlined in this review and attempt to minimise these in future. Primarily, more emphasis should be placed on designing studies which are fitting with study objectives. Prospective designs are the only

designs that allow true predictive validity to be investigated, yet these are rarely implemented. Variables that are known to co-vary and confound the insight – violence relationship such as medication adherence should also be clearly identified and included in the analyses of future research. Further exploration of the influence of psychopathy to the insight – violence relationship is very much warranted, particularly within civil-psychiatric outpatient samples where psychopathy appears less likely to account for poor insight in terms of variance.

### ***Implications for Clinical Practice***

Clinically, this review supports the widely held view that insight is a multi-dimensional concept (Capdevielle et al., 2013). When assessing insight, clinician's should clarify the dimension they aim to measure and ensure they use a corresponding assessment. Use of insight assessment tools without consideration of this issue may lead to measurement of unintended dimensions and misleading results. Clinicians should also be careful not to assume poor insight in psychosis is directly related to violence as this review has shown this relationship to be complex and dynamic, which is essentially in line with the concepts of insight and violence per se.

In terms of risk assessment and management, this review supports the inclusion of poor insight as a risk factor for violence in the HCR-20v3, primarily as the measure implements a multi-dimensional approach to insight which is supported by the current findings. Secondly, 8 of the studies in this review evidenced a positive relationship between poor insight and violence and this should not be over-looked. HCR-20v3 authors and health-care professionals should however be aware that this relationship is contestable and requires additional research before we can be confident about its true extent. Subsequently, professionals should be proportionate in the use of

poor insight as a risk factor for violence and continue to reinforce the structured professional judgement approach by placing patient's idiosyncratic characteristics at the forefront of violence risk assessment.

### ***Limitations***

This review included articles produced only in English. However, this was not to the detriment of cultural heterogeneity, with articles included from a wide variety of countries. Samples with patients under the age of 16 were also excluded due to the wide range of variables that can contribute towards both insight and violence in this population, such as impulsivity in relation to adolescent brain development (Araín et al., 2013). Similarly, studies that included patients with intellectual disabilities were excluded due to a higher level of violence in this population (Taylor & Novaco, 2013) which may have skewed findings.

A meta-analysis may also have provided clarity on the overall strength of a relationship between poor insight and violence. However, as this was the first systematic review on the topic, it was felt important to pursue a focus on the vast methodological weaknesses in the area, which indeed are likely to have reduced the reliability of statistical results. The wide range of insight and violence measurement tools used by studies within this review also limited the suitability for a meta-analysis.

Lastly, it is acknowledged that there may be data related to insight and violence in psychosis which has not been reported by studies, such as within individual HCR-20 'C1 - lack of insight' item ratings. Should this data have been measured reliably and reported by studies, it may have held

implications for our findings. There is therefore an opportunity for future research to seek out unreported data in relation to insight and violence in psychosis and to conduct a meta-analysis using the same.

### ***Conclusion***

The relationship between poor insight and violence in psychosis is dynamic, complex and can be influenced by other variables such as psychopathy. This systematic review has subsequently found partial evidence in support of a relationship between poor insight and violence in psychosis. Our findings suggest that poor clinical insight specifically, is a more robust predictor of violence in patient samples with lower levels of psychopathy than in samples where psychopathy rates are higher. Poor cognitive insight appears to be associated less with violence than poor clinical insight across patient samples.

This review also highlighted the multi-dimensionality of insight in those experiencing psychosis and reinforces the difficulties which can be created by a lack of clarity around the concept and by use of inappropriate measurement tools for the same. Future quality research focussing on insight in psychosis and its relationship to violence, taking account of confounding variables such as medication adherence and psychopathy, is very much required across diverse patient populations. Additional research may facilitate increased confidence in the use of poor insight as a risk factor for violence in psychosis. It may also improve the knowledge base around psychosis generally, in an effort to reduce the stigma and inequalities faced by individuals experiencing this severe and enduring mental health problem.



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